Thailand: Country Update

The Association of Siamese Architects under Royal Patronage

23 May 2017
Compiled by Dr. Acharawan Chutarat

1 Key Policies and Trends

Key Policies and Trends -

Paris Agreement and Thailand

2010

Efficiency	**Reduce energy intensity by 30%** compared with 2010 by 2036 through the removal of fossil-fuel subsidies and accelerated energy efficiency improvements.
Renewables	Renewables to reach **20% of power generation** by; biofuels to reach 20% of transport fuel use by 2036.
Nuclear	Two commercial reactors have been planned since 2007, although progress has stalled since the Fukushima Daiichi accident.

2036

Thailand Integrated Energy Blueprint (TIEB)

- PDP2015

- EEP2015

- AEDP2015

- Oil Plan 2015

- Gas Plan 2015

Key Policies and Trends -

Power Development Plan (PDP2015)

Fuel	Percentage in 2014	Percentage in 2026	Percentage in 2036
Imported hydro power	7	10 - 15	15 – 20
Clean coal including lignite	20	20 - 25	20 – 25
Renewable energy including hydro	8	10 - 20	15 – 20
Natural gas	64	45 - 50	30 – 40
Nuclear	-	-	0 – 5
Diesel/Fuel oil	1	-	-

Table 4.1 the estimated long-term GDP growth by NESDB (September 2, 2014)

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
GDP	2.0	4.0	4.4	4.7	4.3	4.1	4.2	4.2	4.1	4.0	4.1	4.0

Year	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
GDP	4.0	4.0	3.9	3.8	3.8	3.9	3.8	3.8	3.8	3.8	3.8

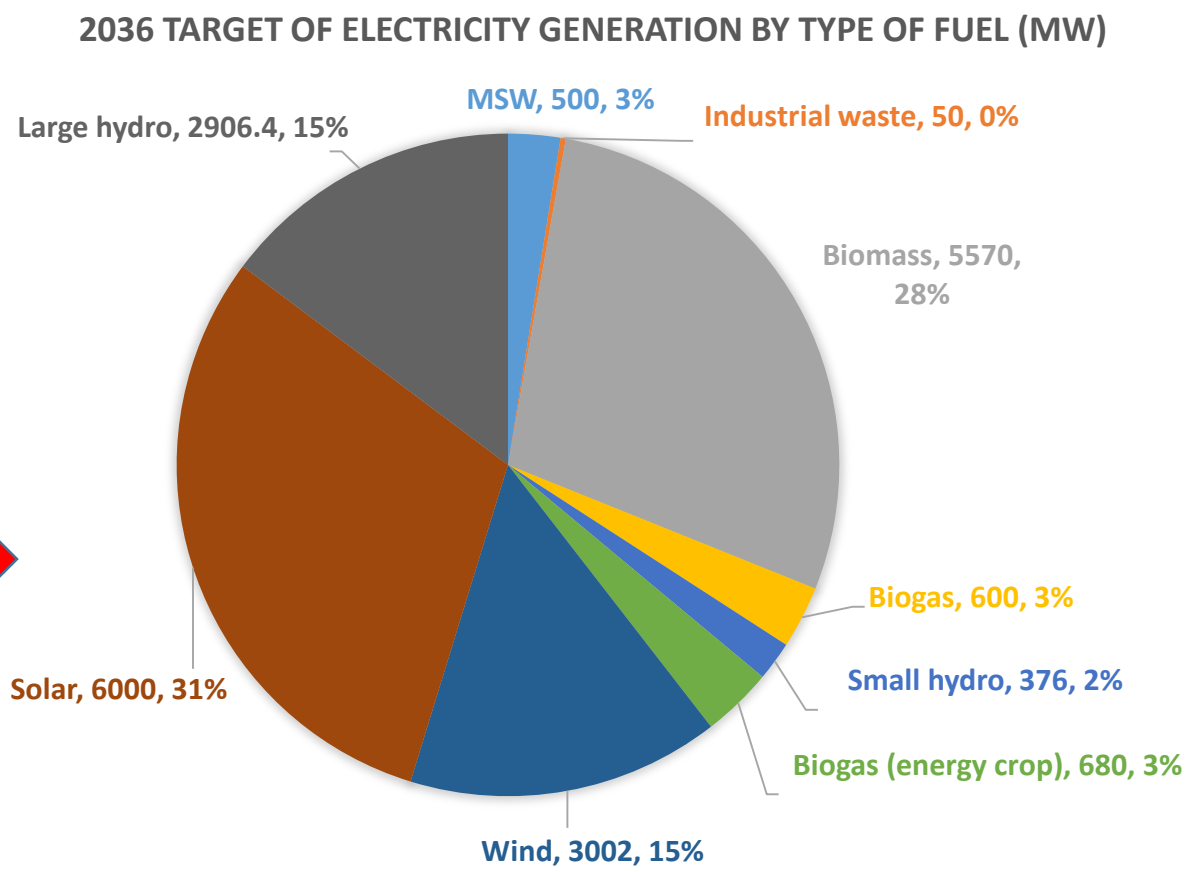
GDP Average growth :
3.94% per year

Alternative Energy Development Plan (AEDP2015)

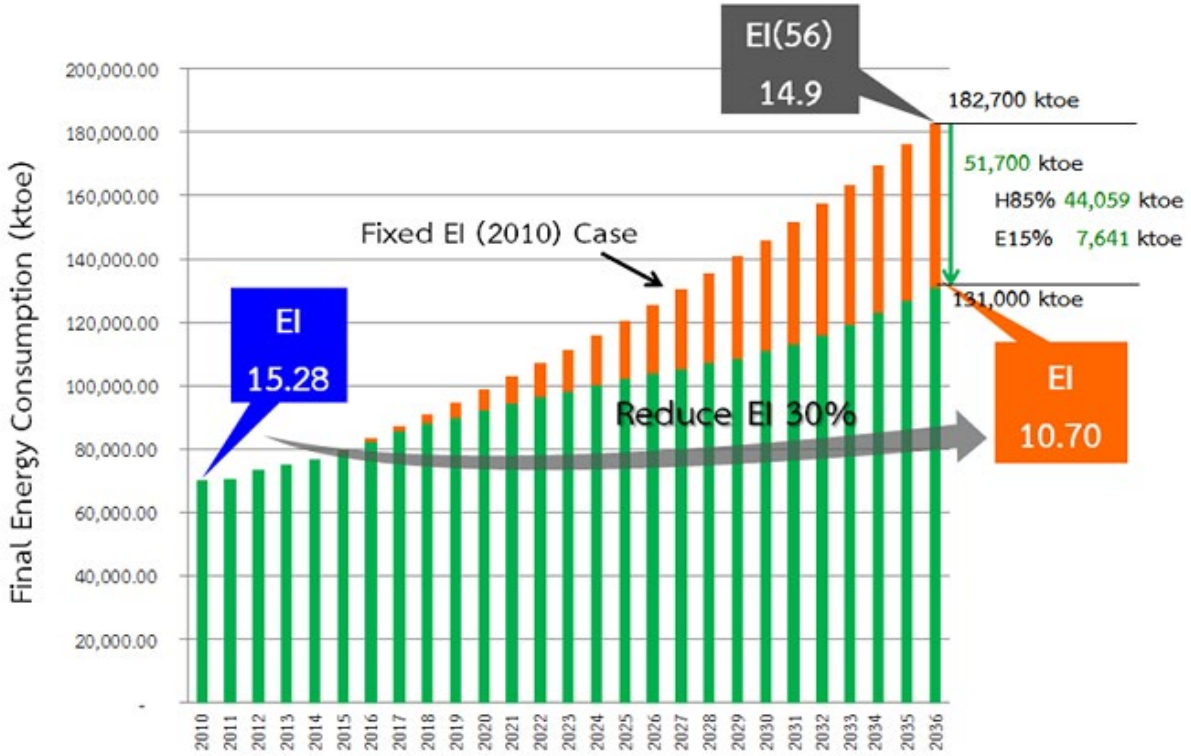
AEDP2015 target is to replace 30 percent of final energy consumption with RE in from of electricity, heat and Bio-fuel by 2036

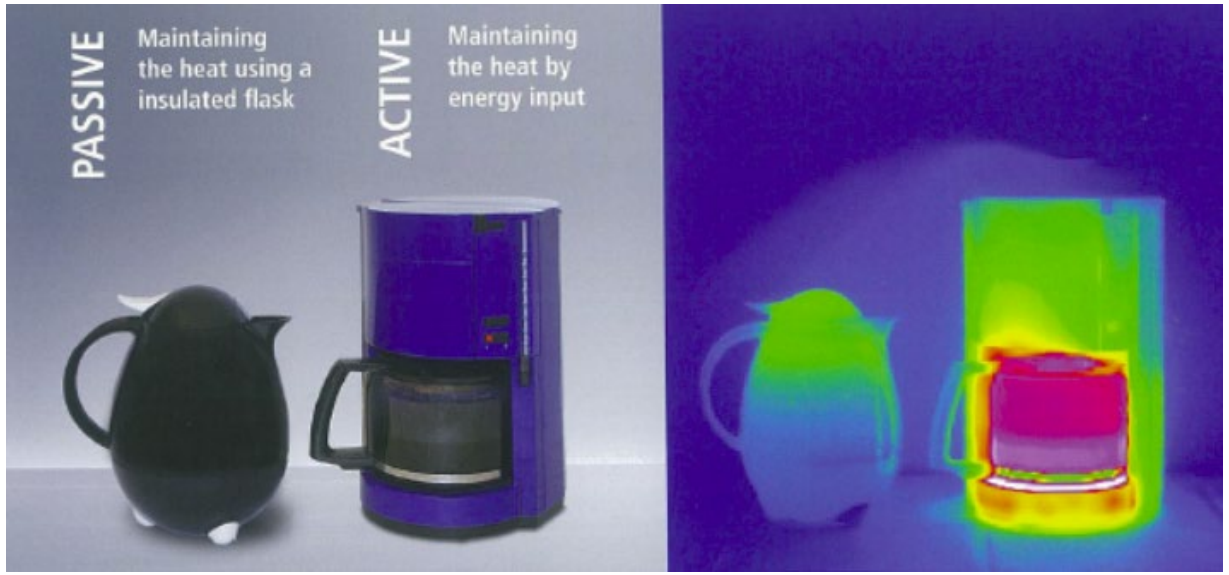
Table 3.1 AEDP Target

Energy	Share of RE (%)		Final Energy Consumption at 2036
	Status As of 2014	Target by 2036	
Electricity: Electricity	9	15 - 20	27,789
Heat: Heat	17	30 - 35	68,413
Bio-fuels : Fuels	7	20 - 25	34,798
RE : Final Energy Consumption	12	30	131,000



Energy Efficiency Plan (EEP2015)





"Reduced expandable use of energy and Energy efficiency improvement"

Key Policies and Trends -

Energy Efficiency Plan (EEP2015)

High Energy Performance Standards (HEPs) + Minimum Energy Performance Standards (MEPs)	• Vehicles-high EE vehicles, mandatory energy labeling, enforcement of MEPs • Enforcement of MEPs for appliances, buildings and vehicles
Building Energy Code (BEC)	Energy Conservation Promotion Acts (1992, 2009) Royal Decree on designated buildings (1995) **> 2000 m2: 5 majors: OTTV-RTTV, Lighting, A/C, hot water, whole building compliance and Renewable energy**
Energy Efficiency Labeling	Mandatory of Labeling for appliances, buildings and vehicles, Environmental Impact Assessment (EIA)-for >4000m2 residential, >10,000m2 commercial project EGAT's electrical appliance labeling Thai Green Building Institute labeling (TGBI)
Monetary Incentives	Funds for amount of energy saved, R&D technologies, HR, ESCO, low interest rate, tax, EE product cost subsidy 20% and < 3M Baht, soft loan Government Housing Bank (GHB) Standard offer Program (SOP) Technical assistance for EERS
Energy Efficiency Resource Standards (EERS)	Large scale energy business is required for minimum EERS

a revised **Building Energy Code** to be effective in **2017** for large buildings > **10,000 sqm.**, new and old. In **2019** will apply to buildings > **5,000 sqm.**, and to > **2,000 sqm. in 2022.**

The new Building Energy Code (BEC) + Web-based tool

		Existing BEC		Draft New BEC (late 2017 or early 2018)
Max. RTTV (Roof Thermal Transfer Value) For building type A,B,C*		15, 12, 10 W/m^2	→	**10, 8, 6 W/m^2**
Max. OTTV (Overall Thermal Transfer Value) For building type A,B,C*		50, 40, 30 W/m^2	→	**50, 40, 30 W/m^2**
Max. LPD (Lighting Power Density) For building type A,B,C*		14, 18, 12 W/m^2	→	**10, 11, 12 W/m^2**
A/C	Split type	COP > 3.22 (2E BUILDING)	→	**COP > 3.22-4.39** (5)
	Air-cooled chiller	kW/ton < 1.31-1.33	→	**kW/ton < 1.12**
	Reciprocating	kW/ton < 1.24		**kW/ton < 0.88**
	Rotary /Screw and Scroll	kW/ton < 0.78-0.89		**kW/ton < 0.70**
	Centrifugal	kW/ton < 0.62-0.76		**kW/ton < 0.61-0.67**
Renewable Energy		Only PV energy is considered.	→	**PV energy, Heat to electrical energy, and Other renewable energy are considered.**

* Type A = Office, School
Type B = Commercial and public buildings
Type C = Hotel, Heatlhcare, Apartment

Key Policies and Trends -

12th National Economic and Social Development Plan (2017-2022)

- identifies **“Green City”** project and **carbon reduction plan** in its sustainable development strategy.
- enacts laws requiring **Strategic Environmental Assessment (SEA)** in public policies, plans, programs.

Office of Natural Resources and Environmental Policy and Planning (ONEP)

- develops **“Low-Carbon City”** strategies and collaborates with municipalities to plan and implement district development programs.

Thailand Regulatory Roadmap

National and PEA Plans and Policies – Smart Grid Focused

Thailand Regulatory Roadmap — Regulatory Strategy

Today 2015 | 2020 | 2025 | 2030 | 2035

EPPO

Thailand Smart Grid Roadmap (2015-2036)

- **2015-2016:** Strategy & Road map
- **2017-2021:** Short-term R&D Pilot; Develop on SG pilot
- **2022-2031:** Mid-term R&D Pilot; Building foundation of smart grid infrastructure
- **2032-2036:** Long-term R&D Pilot Building advanced smart grid infrastructure

2013:
- Emergency Response Arrangements Development Plan

2015 – 2016:
- Demand Response in Energy Crisis Study Project

EGAT Smart Grid Roadmap (2013 – 2032)

- **2013 – 2017:** Foundation and Framework Development
- **2018 – 2022:** Pilot and Backbone Implementation
- **2023 – 2027:** Deployment and Assessment
- **2028 – 2032:** Full Scale Integration

2013:
- EGAT Smart Grid Pilot Project – Mae Hong Sorn

MEA Smart Grid Roadmap (2012 – 2021)

- **2012-2016:** Laying the foundations
- **2017-2021:** Large scale implementation

PEA Smart Grid Roadmap (2012 – 2026) – existing roadmap

- **2012-2016:** Laying the foundations
- **2017-2021:** Large Scale Integration
- **2022-2026:** Optimal Stage

2015:
- CBS System Implementation Phase 2
- GIS System Development Phase 3
- Enterprise Architecture Development
- IT Governance Development

Industrial AMR (until 2018) — **2018:** 160,000 AMR meters deployment to Industrials

Pattaya Pilot (2016 – 2018) — **2018:** 116,308 AMI meters deployment

Raman — 18,000 AMI meters deployment to customers in Yala province

AMI — **Residential AMI Roll Out(2015 – 2016)** 60,000 AMI meter roll out to customers interested in TOU

PEA ICT Master Plan (2013-2020)

Electricity Tariff (2011 - present)

2011:
- Tariff Rate: announced <50 kWh free of charge)

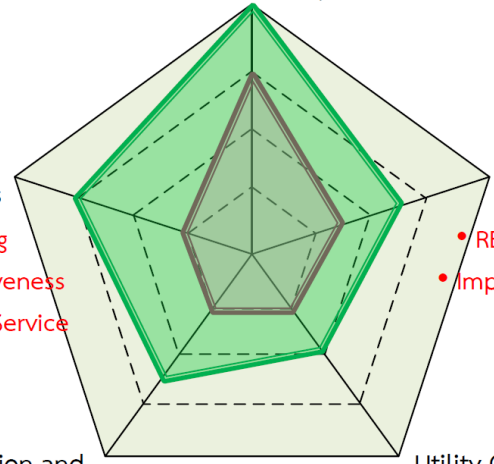
DR Roadmap (2015 – 2020)

2015: Planned DR events:
1. Peak Cut (Apr – May)
2. DR (Apr, Jun, Sep)

2015 – 2016:
- DR Phase 2: Study potential DR Programs
- Load Aggregator Introduction

Master plan of smart grid development2015-2036

Strategies & Objectives



Security — Power Reliability and Quality
- Improved Reliability (e.g. SAIDI, SAIFI)
- Improved Power Quality (V, F)

Sufficiency — Energy Sustainability and Efficiency
- RE/Domestic Energy Dependency
- Improved Utility Asset Management
- Primary Energy Efficiency
- Microgrid Development

Efficiency — Utility Operation and Service
- Improved Quality of Services / New Services
- Work Process Efficiency

Awareness — Integration and Interoperability
- Device and ICT Upgrading for Interoperability
- Accessibility and Interchangeability

Competitiveness — Economic and Industrial Stimulus
- Human Capacity Building
- Enhanced EMS for Competitiveness
- SG Technology, Product and Service Development & Export

Thailand Green Building Institute

Established By ASA + EIT

Thai's Rating of Energy and Environmental Sustainability, not yet endorsed by government.

Released:

1.TREES – **NC** *V1.1* for New Construction and Major Renovation

2.TREES – **PRE NC** (for FAR Bonus) for Preparation of New Construction and Major Renovation

3.TREES – **NC / CS** for New Construction and Major Renovation and Core and Shell Building

4.TREES – **EB** (Existing Building)

Developing:

TREES – **NC** *V1.2*

TREES

Thai's **R**ating of **E**nergy and **E**nvironmental **S**ustainability

Bangkok New City Planning Code

1. Affordable housing

2. Urban public space

3. Mass transit Park & Ride

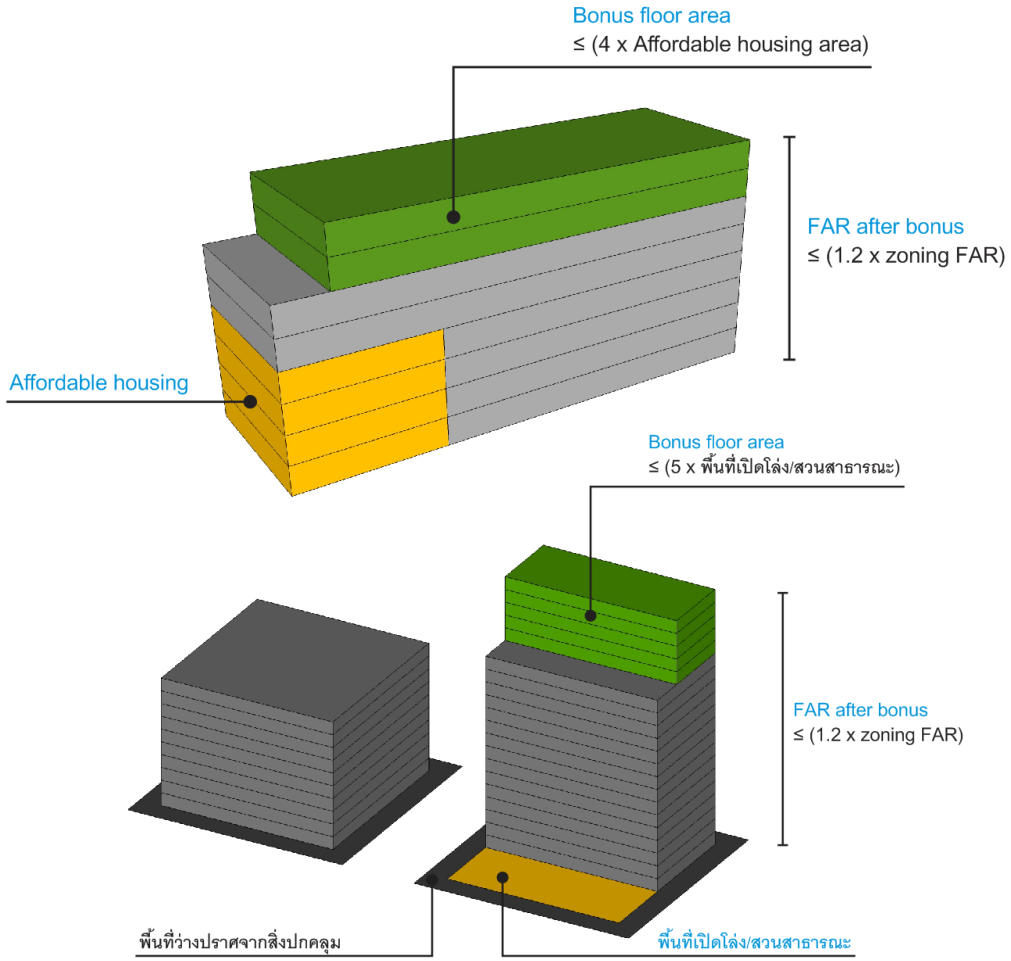
4. Rain water retention can have 5% more buildable area

5. Green building

Developments that are certified green **(TGBI)** can have **5-20%** more buildable area

5% for 1st Level (Certified)
10% for 2nd Level (Silver)
15% for 3rd Level (Gold)
20% for 4th Level (Platinum)

Must pass OTTV/RTTV of the Thai Building Energy Code



within 500 m radius from mass transit station: **30 m² bonus** floor area per 1 **free parking space**

50 m² of site area per **1 m³ of water retention**

Credit: Dr.Atch S.

Thai Green Building Institute (TGBI) refused to become GBC member.

Membership fee, organization and requirements and benefits benefits

2 Resilient/Sustainable Projects

Resilient / Sustainable Projects -

Green Certificate and Supports

- Green Label Program (Thai Environmental Institute)
- Green Leaf Hotel
- “Number 5” electrical appliances (EGAT)
- Energy Labeling Program (DEDE)
- Thailand Energy Awards
- ASA Green Building Award
- Thai Green Building Institute (ASA/EIT)
- Pollution Control Department (Green Government Building)

Adapted from: Dr.Atch S.

Resilient / Sustainable Projects -

Low Carbon Municipality Projects (2012-2015)

- Initiated by National Municipality League of Thailand (NMT) with support from European Union from 2012-2015
- Total 175 cities (N 61, NE 56, Central 20, E 14, S 24) participated to gain awareness, knowledge, changes toward low carbon cities under 4 strategies.
- Implemented with measurable KPIs, follow up procedures and PR
- Results from potential cities to be further developed have been fully implemented in 2015-2017

http://www.lcm.in.th/about-project.php

Resilient / Sustainable Projects -

Developing 15 Low Carbon-Bike-Resilient Prototype Cities (2015-2017)

Local vision, mission, policies and strategic action with objectives and time frame

Assigned tasks to responsible teams with policies to strengthen and drive organization and public

Create activities to build understanding, potential and knowledge with database system

Communicate and PR to all stakeholders through participatory processes and follow up procedures for lesson learned.

Low Carbon city

Bike city

Resilient city

Happy, Well-Being People Sustainable Environment

Resilient / Sustainable Projects -

Thai Environment Institute

Asian Cities Climate Change Resilience Network: ACCCRN

: Hadyai and Chiangrai as pilot projects

Mekong-Building Climate Resilience Asian Cities: M-BRACE

: Udornthani and Phuket as pilot projects

Urban Climate Resilience in Southeast Asia Partnership Project

Smart Cities Clean Energy: Implement 7 cities (22 May,2017)

กระทรวงพลังงาน
MINISTRY OF ENERGY

TGBI

Smart Cities Clean Energy

พลังงานอัจฉริยะ (Smart energy)

การสัญจรอัจฉริยะ (Smart mobility)

ชุมชนอัจฉริยะ (Smart community)

สิ่งแวดล้อมอัจฉริยะ (Smart environment)

เศรษฐกิจอัจฉริยะ (Smart economy)

อาคารอัจฉริยะ (Smart building)

การบริหารจัดการเมืองแบบอัจฉริยะ (Smart governance)

นวัตกรรมอัจฉริยะ (Smart Innovation)

asa

Resilient / Sustainable Projects -

Bangkok Resilient City: 3 Strategic Pillars

Official announcement and 70+ projects, launched, February, 2017

Flood

Quality of Life

Economic

Flood protection

Mobility

Emergency Responsive Plan

Health + Well-Being

Economic + Equality

Bangkok Strategic Plan Objectives

Scope of the Master Plan

(1) Environmental Sustainable Transport;

(2) Energy Efficiency and Alternative Energy;

(3) Efficient Solid waste management and Wastewater Treatment,

(4) Green Urban Planning; and

(5) Adaptation planning

BAU emission and mitigation targets in 2020 (by Sector)

Sector	Year 2013	Year 2020		
	GHG emission	Future GHG emission in BAU Scenario	Future GHG emission with Bangkok Master Plan Implementation	Expected reduction/ absorption amount (reduction rate against BAU)
Transport	13.76	17.91	14.91	3.00 (-16.75%)
Energy	25.60	30.94	26.85	4.09 (-13.22%)
Waste and wastewater	4.55	4.93	4.73	0.20 (-4.06%)
Green urban planning	-0.045	-0.045	-0.049	-0.004 (+8.89%)
Total	43.87	53.74	46.44	7.29 (13.57%)

100 Resilient Cities—Pioneered by the Rockefeller Foundation (100RC)

Thank you